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Domestic violence and alcohol use: Trauma-related symptoms and motives for drinking ☆

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Abstract

Alcohol use is frequently associated with posttraumatic stress disorder (PTSD), especially in the face of chronic traumatic experiences. However, the relationship between alcohol use and symptoms associated with chronic trauma exposure has not been evaluated. This study examined alcohol use in recently battered women (N=369). Differences were found in trauma symptoms between abstainers, moderate drinkers, and heavy drinkers, with heavy drinkers reporting more severe symptoms. Mediational analyses suggest that the relationship between drinking and trauma symptoms is mediated by drinking to cope, which has not been previously demonstrated in a battered population. Results suggest the importance of assessing trauma symptoms and motives for drinking in understanding alcohol use in recent survivors of domestic violence.

Keywords: Alcohol use; Victimization; Expectancies; Family violence; Stress reactions

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1. Introduction

Compared with men, women are disproportionately exposed to chronic types of interpersonal violence (IPV), such as domestic violence (Kessler, Molnar, Feurer, & Appelbaum, 2001; Jones, Hughes, & Unterstaller, 2001). Chronic traumatic events have been implicated in more severe post-trauma symptomatology, such as depression, PTSD, and complex PTSD (CPTSD), a proposed diagnosis intended to address trauma-related psychopathology (Herman, 1992; Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997). Chronic traumatic events have also been associated with increased problems with alcohol use (Clark & Foy, 2000; Simpson, 2003; Stewart, 1996). However, the relationships among IPV, alcohol use, trauma symptoms, and motives for drinking have been relatively unaddressed in the literature. This study examines alcohol use among battered women from a community sample. Particular attention is paid to the predictive value of trauma symptoms and motives for heavy episodic drinking.

1.1. Exposure to chronic traumatic events and trauma symptoms

As noted above, chronic traumatic events have been associated with multiple negative sequelae. The term "complex PTSD" has been proposed to capture a broad range of affective, behavioral, and interpersonal symptoms (Herman, 1992) thought to be associated features of PTSD (Roth et al., 1997), including changes in affect regulation, difficulties with impulsivity, alterations in consciousness or attention, disruptions in sense of self, disruptions in interpersonal relationships, somatization, and changes in beliefs (Allen, Coyne, & Huntoon, 1998; Ford & Kidd 1998; Roth et al., 1997). Follow-up studies examining CPTSD across various types of chronic traumatic IPV found support for the clinical usefulness of the symptom constellation (e.g., Ford & Kidd, 1998; Roth et al., 1997).

1.2. Exposure to chronic traumatic events and alcohol use

Exposure to repeated interpersonal traumatic events also has been associated with alcohol use and alcohol use disorders (Nelson et al., 2002; Volpicelli, Balaraman, Hahn, Wallace, & Bux, 1999). Specifically, IPV is associated with greater likelihood of alcohol-related consequences in women (Rice et al., 2001). In a large prospective study, IPV during the first year of marriage was predictive of heavy episodic drinking one year later (Testa, Livingston, & Leonard, 2003).

1.3. Trauma symptoms and alcohol use

The relationship between chronic traumatic events and both alcohol-related consequences and heavy episodic drinking appears to be explained by PTSD symptoms (for reviews, see Jacobsen, Southwick, & Kosten, 2001; Stewart, 1996), such that those meeting criteria for PTSD are also more likely to experience negative consequences related to drinking and to engage in heavy episodic drinking. Further, research examining the functional relationships among trauma, PTSD, and alcohol use has consistently found that drinking is motivated by various coping-oriented reasons. These include using alcohol to medicate sleep difficulties (Nishith, Resick, & Mueser, 2001) and to reduce negative affect (Cannon et al., 1992), tension (Simpson, 2003), and PTSD hyperarousal symptoms (Stewart, Conrod, Samoluk, Pihl, & Dongier, 2000). In addition, associations have been found between alcohol consumption and higher levels of intrusive symptoms of PTSD (Read, Brown, & Kahler, 2004).

The self-medication hypothesis has been proposed as an explanation for the relationship between PTSD symptoms and alcohol use (McFarlane, 1998; Stewart, 1996). The self-medication hypothesis states that alcohol is used to reduce or manage symptoms of PTSD, and negative reinforcement maintains the alcohol use. In support of this theory, negative reinforcement has been found to mediate the relationship between psychological distress and alcohol use in sexual assault victims (Miranda, Meyerson, Long, Marx, & Simpson, 2002).

1.4. Motives for drinking in trauma populations

Coping motives are beliefs regarding the use of alcohol as a means to cope with negative affect and psychological distress (Cooper, Frone, Russell, & Mudar, 1995). Studies examining coping motive models of post-trauma alcohol use in women have found significant relationships between coping motives and alcohol consumption and between coping motives and PTSD, depression, and anxiety symptoms (Grayson & Nolen-Hoeksema, 2005; Schuck & Widom, 2001; Ullman, Filipas, Townsend, & Starzinski, 2005). In these studies, coping motives were found to act as a mediator between psychological distress and alcohol use (Grayson & Nolen-Hoeksema, 2005) and as a mediator between PTSD and alcohol problems (Ullman et al., 2005). Consistent with the self-medication model, these findings suggest coping motives are a critical component in explaining trauma-related alcohol use. However, these relationships have been demonstrated only in victims of sexual victimization. Thus, it is unknown whether coping mediates the relationship between trauma symptoms and alcohol use in other trauma-exposed populations.

2. Rationale of the present study

As noted, previous research has addressed the relationship between exposure to chronic traumatic events and alcohol use; however, the potential contributing role of trauma symptoms, including symptoms of both PTSD and CPTSD, to problematic alcohol use has not been examined. In addition, relatively little of the research conducted has focused on potential explanatory mechanisms of the relationships between trauma symptoms and heavy episodic drinking (Grayson & Nolen-Hoeksema, 2005; Ullman et al., 2005). The present study represents secondary data analysis from a larger study of the acute impact of IPV (R01MH55542). We hypothesized a strong positive relationship between peak alcohol consumption and trauma symptoms. We expected to find higher levels of intrusive (Read et al., 2004) and hyperarousal symptoms (Stewart et al., 2000), more affective dysregulation (Grayson & Nolen-Hoeksema, 2005), and more dissociative symptoms (Rodriguez-Srednicki, 2001) among women who drank heavily than among moderate drinkers or abstainers. We also expected to find the relationship between trauma symptoms and heavy episodic drinking mediated by drinking to cope.

3. Methods

3.1. Participants

This sample consisted of 369 participants recruited from local domestic violence shelters (49%) and other victim-assistance agencies (51%) through flyers. Sixty-seven women did not meet inclusion

criteria during the telephone screenings. Twelve additional women were excluded due to apparent psychosis, illiteracy, intoxication at the time of the assessment, or potential danger to the participant. During telephone screenings, relationship duration and abuse severity were assessed. Participants must have experienced battering within the context of an intimate relationship of three months or more (M=7 years, SD=7 years). The screening criteria for battering severity were based on the modified Conflict Tactics Scale (Straus, Hamby, Boney-McCoy, & Sugarman, 1996) and were defined as four or more behaviors from the lower level items, two or more severe behaviors, or any combination of four or more severe and minor behaviors from separate incidents during the past 12 months. The most recent incident must have been between two and 24 weeks prior to assessment (M=43 days, SD=35 days) to ensure that participants were not in acute crisis associated with a very recent assault but had experienced relatively recent abuse. Generally the women had experienced chronic IPV (M=5 years, SD=6 years; range 1 to 30 years). Sample descriptives are presented in Table 1. Chi-square and mean comparisons found no significant differences in demographics or prior trauma histories between abstinent, moderate, and heavy drinkers, with the exception of education and household income.

Table 1
Participant characteristics by peak alcohol use

	Abstain (n=170)		Moderate user (n=73)		Heavy user (n=83)		Total sample (N=326)	
	N	%	N	%	N	%	N	%
Age/Mean (SD)	34.6 (8.4)		35.1 (7.7)		34.8 (7.6)		34.8 (8.0)	
Education/Mean (SD)[a]	12.4 (2.0)		13.2 (1.9)		12.5 (2.1)		12.6 (2.0)	
Ethnicity								
African American	118	69.4	42	57.5	59	71.1	219	6.7
Caucasian	43	25.3	24	32.9	22	26.5	89	27.3
Other	9	5.3	7	9.6	2	2.4	18	5.5
Personal income								
Below 10,000	107	62.9	32	43.8	43	51.8	96	29.4
10,000–30,000	56	32.9	36	49.3	35	42.2	132	40.5
30,000 and above	7	4.1	5	6.8	5	6.0	93	28.5
Household income[b]								
Below 10,000	62	36.9	21	25.9	13	18.1	182	55.8
10,000–30,000	62	36.9	40	49.4	30	41.7	127	39.0
30,000 and above	44	26.2	30	24.7	29	40.3	17	5.2
Prior trauma exposure								
Childhood sexual abuse	88	51.8	39	53.4	38	45.8	165	50.6
Child physical abuse	97	57.1	39	53.4	46	55.4	182	55.8
Adult rape	63	37.1	33	45.2	35	42.2	131	40.2

[a]One-Way Analysis of Variance, $F(2, 325)=4.18$, $p<.05$; Tukey HSD MU>AB=HU, $p<.05$.
[b]χ^2 (4, n=321)=12.78, $p<.05$.

3.2. Measures

Participants completed a battery of self-report and interviewer-administered measures as part of a larger study. The following instruments are relevant to this paper:

Timeline Followback (TLFB; Sobell & Sobell, 1992) was used to assess alcohol use. It has good psychometric properties and provides valid data (Sobell, Brown, Leo, & Sobell, 1996). For the present study we defined heavy episodic drinking as four or more standard drink units in a single day (Wechsler, Dowdall, Davenport, & Rimm, 1995) and tallied the number of heavy drinking days in a typical month during the last six months. This procedure was followed because of the high proportion of women living in shelters where drinking was prohibited.

Drinking Motives Measure (DMM: Cooper, Russell, Skinner, & Windle, 1992) has 15 items that assess motives for alcohol use. It has three subscales: Social Motives, Enhancement Motives, and Coping Motives. Research has supported construct and convergent validity of the DMM in adult samples (Cooper et al., 1992), and in our sample Cronbach's alphas for subscales ranged from .91 through .93. Because high interscale correlations were found among the subscales in this sample, the present analyses were limited to the Coping Motives subscale for its theoretical interest.

Trauma Symptom Inventory (TSI: Briere, Elliott, Harris, & Cotman, 1995) is a 100-item scale designed to measure both acute and chronic trauma symptoms, including many symptoms of PTSD and CPTSD. Factor analysis has established three factors: the Dysphoria factor consisting of the depression, anger-irritability, and anxious arousal subscales; the Trauma factor, consisting of the intrusive experiences, defensive avoidance, dissociation, and impaired self-reference subscales; and the Self factor, consisting of the sexual concerns, dysfunctional sexual behavior, and tension reduction behavior subscales (Briere, 1995). The TSI has exhibited reasonable convergent, predictive, and incremental validity (e.g., Briere et al., 1995; McDevitt-Murphy, Weathers, & Adkins, 2005). In the current sample, the internal consistency of the three TSI factors ranged from .93 through .94.

3.3. Procedures

Assessments were conducted at the Center for Trauma Recovery at the University of Missouri-St. Louis (UMSL) and at area battered women shelters. The study was approved by the Institutional Review Board of UMSL and written informed consent was obtained for all participants. Participants were compensated for participation.

3.4. Data analytic strategy

The first analysis was conducted to test whether trauma symptoms would be higher in those with heavy peak alcohol consumption. A multivariate analysis of variance (MANOVA) was conducted with the sample divided into three groups, abstainers (AB; no use of alcohol during the month), moderate users (MU; <4 drinks in peak drinking episode), and heavy users (HU; ≥ 4 drinks in peak drinking episode), with the three TSI subscales as the dependent variables. A categorical approach was chosen to reflect standard cut-offs used by clinicians, thereby making our results easier to translate to clinical settings.

Table 2
Coping drinking motives and trauma symptom inventory scores by peak alcohol use

	Abstain (n=170)		Moderate user (n=73)		Heavy user (n=83)		Total sample (N=326)	
	M	SD	*M*	SD	*M*	SD	*M*	SD
Drinking to cope	6.11	2.63	8.33	3.48	10.83	4.47	7.85	3.95
Dysphoria factor*	44.25	17.48	44.56	15.00	51.02	14.03	46.04	16.43
Depression*	14.54	6.33	14.37	6.02	16.58	5.56	15.01	6.14
Anger-irritability*	15.24	6.89	15.47	6.33	17.35	6.30	15.83	6.69
Anxious arousal*	14.47	6.23	14.73	5.53	17.10	4.99	15.19	5.89
Trauma factor*	62.25	22.12	62.56	19.52	71.23	17.84	64.46	21.06
Intrusive experiences*	15.12	6.49	14.96	5.85	17.51	5.53	15.65	6.22
Defensive avoidance*	17.34	4.97	17.10	4.91	19.11	4.12	17.70	4.86
Dissociation*	14.95	7.42	14.82	7.18	17.49	6.45	15.53	7.25
Impaired self-reference *	14.84	6.91	15.68	6.27	17.12	5.68	15.57	6.55
Self factor	27.71	18.60	29.88	17.96	32.48	15.59	29.37	17.81
Sexual concerns	11.85	7.46	11.62	6.75	13.42	6.36	12.16	7.05
Dysfunc. sexual behavior	7.91	7.59	9.16	7.49	9.81	7.11	8.66	7.47
Tension reduction behavior	7.95	5.68	9.10	5.78	9.25	5.22	8.55	5.62

*Note: Tukey HSD HU>AB/MU, $p<.05$.

Means and standard deviations are presented in Table 2. Second, a series of regressions was conducted to test whether relationships between trauma symptoms and heavy peak alcohol use found to be significant in the MANOVA were mediated by drinking to cope.

3.4.1. Missing data

All measures of interest for this paper were completed by 323 participants; forty-four participants were missing one or more items (12%). No differences between those with complete and incomplete data were found on any of the primary variables of interest.

3.4.2. Data screening

Data were examined for compliance with the assumptions of multiple regression analyses. Two univariate outliers (z-scores more than 3 standard deviations from the mean) were identified and removed. Normality was assessed through the use of histograms.

Table 3
Intercorrelations for peak alcohol use, trauma symptoms, and drinking to cope in women who drink (N=154)

Measure	1	2	3	4
1. Peak Alcohol Use	–			
2. Dysphoria	.18	–		
3. Trauma	.19	.82	–	
4. Coping motives	.26	.29	.22	–

Note: Peak Alcohol Use coded as 1=moderate user or 2=heavy user. All analyses including peak alcohol use conducted using Kendall-tau statistic. All correlations significant, $p<.01$.

3.4.3. Mediation analysis approach

Statistical analyses were conducted in accordance with Baron and Kenny's (1986) and Holmbeck's (1997) recommendations for testing mediation through the use of simultaneous regression analyses. Mediation was considered present if the following conditions existed: (1) the IV affected the mediator, (2) the IV affected the DV, and (3) the mediator affected the DV, with a significant decrease in the relationship between the IV and DV. The mediated effect was tested statistically by dividing that effect by its standard error to obtain a *z*-score and comparing this *z*-score to a normal distribution (Baron & Kenny, 1986). Correlations are presented in Table 3. The mediation analyses on drinking motives were conducted solely on those women who reported drinking.

4. Results

4.1. Recent alcohol consumption

Of the women who reported using alcohol, the average drinking days in a month was nearly seven (M=6.7, SD=7.4). The average number of standard drinks consumed during one day was 4.2 (range: .25–25; SD=5.3).

4.2. Peak drinking and trauma-related symptoms

With the use of Wilks' criterion, the combined DVs were significant, $F(6, 638)=2.14$, $p<.05$. The univariate tests were statistically significant for dysphoria, $F(2, 323)=5.21$, $p<.01$, and trauma factors, $F(2, 323)=5.69$, $p<.01$. Based on a Tukey HSD posthoc comparison between the three groups, the HU

Table 4
Sequential regression analyses of mediation of trauma symptoms and peak alcohol use by drinking to cope

Step and variables	*B*	SEB	Wald	R^2
Analysis 1: Dysphoria and alcohol use				.044**
Step 1: IV predicts mediator	−1.438	.549	−.210[a,**]	
Dysphoria predicts coping motives				
Step 2: IV predicts DV				.026*
Dysphoria predicts peak alcohol use	1.089	.546	.162*	
Step 3: Mediated model				.156**
Dysphoria	.567	.521	.084	
Coping motives	−.363	.076	−.368**	
Analysis 2: Trauma and alcohol use				.044**
Step 1: IV predicts mediator	−1.438	.549	−.210[a,**]	
Trauma predicts coping motives				
Step 2: IV predicts DV				.026*
Trauma predicts peak alcohol use	1.089	.546	.162*	
Step 3: Mediated model				.156**
Trauma	.567	.521	.084	
Coping motives	−.363	.076	−.368**	

[a]defined as a = β. *p=.05. **p=.05.

group endorsed significantly higher dysphoria and trauma symptoms than the AB and MU groups ($p<.05$) but the AB and MU groups did not differ significantly from each other.

Next, we conducted posthoc univariate ANOVAs to examine group differences in the individual subscales of the dysphoria and trauma factors. For these analyses, the AB/MU groups were combined. Each of these individual tests were significant with the HU group appearing significantly more symptomatic on the depression $F(1, 324)=6.12$, $p<.05$, anger-irritability $F(1, 324)=4.89$, $p<.05$, anxious arousal $F(1, 324)=10.37$, $p<.001$, intrusive experiences $F(1, 324)=7.45$, $p<.01$, defensive avoidance $F(1, 324)=6.78$, $p<.01$, dissociation $F(1, 324)=6.10$, $p<.05$, and impaired self-reference $F(1, 324)=4.55$, $p<.05$ subscales.

4.3. Mediation analyses

4.3.1. Coping motives as a mediator between dysphoria and peak alcohol use

Including only those who reported some drinking, coping motives were assessed as a mediator of dysphoria and peak alcohol use using the coping scale of the DMM, the dysphoria factor of the TSI, and TLFB (Table 4). Logistic regression was used for all analyses involving alcohol use. Dysphoria was significantly associated with coping motives, $F(1, 153)=20.64$, $p<.05$ and with peak alcohol use, $\varkappa^2$ (1, 154)=7.52, $p<.05$. The full model was also significant, $\varkappa^2(2, 154)=17.80$, $p<.05$. Coping motives was the only significant predictor of peak alcohol use in the full model. The mediation of the relationship between dysphoria and peak alcohol use by coping motives was statistically significant, $z=2.86$, $p<.05$.

4.3.2. Coping motives as a mediator between trauma symptoms and peak alcohol use

Including only those who reported some drinking, coping motives were assessed as a mediator of trauma symptoms and peak alcohol use using the coping scale of the DMM, the trauma factor of the TSI, and TLFB. Trauma was significantly associated with coping motives, $F(1, 153)=7.36$ $p<.05$ and with peak alcohol use, $\varkappa^2(1, 154)=8.14$, $p<.05$. The full model was also significant $\varkappa^2(2, 154)=19.38$, $p<.05$. Both coping motives and trauma were significant predictors of the peak alcohol use in the full model. The mediation of the relationship between trauma symptoms and peak alcohol use by drinking motives was statistically significant, $z=2.14$, $p<.05$.

5. Discussion

5.1. Overview

This study examined relationships between trauma symptoms and heavy episodic drinking in recent domestic violence victims. Although the relationship between exposure to chronic traumatic events, PTSD symptomatology, and increased alcohol problems has been described in previous studies (Schuck & Widom, 2001; Testa et al., 2003), this is the first study to examine whether trauma symptoms, more broadly, are also associated with alcohol use. This study is also the first to provide support for the self-medication hypothesis in a battered sample, examining the role of drinking motives as an explanatory mechanism for these relationships.

5.2. Trauma symptoms and alcohol use

The study results generally support the association of heavy episodic alcohol use with higher trauma symptoms. Heavy episodic drinkers, consuming four or more drinks on a peak drinking day, reported

significantly more pronounced difficulties with dysphoric symptoms as well as more classic trauma symptoms when compared with women who consumed less than four drinks per occasion or abstained from alcohol. The findings on the dysphoria factor suggest negative affect and affect regulation may be important determinants of heavy episodic drinking. These results are consistent with previous research indicating PTSD hyperarousal is associated with heavy drinking (Stewart et al., 2000) and with findings showing an association between depression and alcohol consumption among adult survivors of child abuse, and our results extend this finding to women with recent experiences of IPV (Schuck & Widom, 2001).

As predicted, symptoms on the Trauma factor were significantly higher in heavy drinkers. These results replicate previous findings of increased intrusive and avoidance symptoms (Read et al., 2004) and increased dissociative symptoms (e.g., Rodriguez-Srednicki, 2001) associated with higher alcohol use. Our results suggest negative self-perception also may be more impaired in heavy episodic drinkers.

The lack of differences on the Self factor between the heavy episodic drinkers and others is also of interest. Sexual concerns and tension reduction behavior, both scales on this factor, have been implicated in increased alcohol consumption among women (e.g., Simpson, 2003; Wilsnack, Volgeltanz, Klassent, & Harris, 1997). The relatively weak relationship found between the self factor and heavy drinking may be a function of the acuity and severity of the sample. In this group of battered women, other symptoms more associated with initial safety concerns may be more closely associated with heavy episodic drinking, whereas other functional issues may emerge over time.

5.3. Motives for drinking and alcohol use

The results supported a mediated model, wherein the relationship between trauma-symptoms and heavy episodic drinking was mediated by drinking to cope. The relationship between dysphoria (depression, anger, and, arousal) and drinking was fully mediated by drinking to cope whereas the relationship between the Trauma factor (intrusive symptoms, avoidance, dissociation, and self-perception) and drinking was partially mediated by drinking to cope. These results indicate that self-medication is a viable explanatory model in that those with more severe trauma symptoms who believe that alcohol is a useful way to cope are at greatest risk for heavy alcohol use and maladaptive coping (Stewart, Pihl, Conrod, & Dongier, 1998). However, the results also suggest that for some types of trauma symptoms there may be direct relationships between symptom severity and drinking behavior.

5.4. Limitations

There are several limitations of the present study. It is possible these results may not generalize to men. Moreover, we were not able to rule out the potential role of a PTSD diagnosis or other comorbid psychiatric disorders with the measures used. Further, by choosing women involved with community agencies, it is likely we included a more severe sample of battered women in terms of their level of post-trauma symptoms (Kemp, Green, Hovanitz, & Rawlins, 1995). This may limit generalizability of results to women with similar alcohol and trauma histories who do not or cannot seek help.

The study also had methodological limitations relating to the alcohol assessment. No measure of pre-trauma alcohol use was included, and it is possible that rates of drinking predated the abuse, at least for some of the participants. Also, half the women were residing in shelters where they could be penalized for drinking, which may have artificially reduced their actual alcohol use or willingness to report use in

interviews. To mitigate the latter, confidentiality of interviews was stressed and women were assured responses would not be shared with shelters. Additionally, this paper did not examine other substance use (e.g. marijuana or cocaine), other aspects of drinking behavior (e.g., total consumption, frequency of drinking), presence of an alcohol use disorder, or other potential predictors of alcohol use (e.g., age of onset, family history, additional drinking motives). Further examination of these important issues would be useful to the literature, but beyond the scope of the current paper.

Finally, it is important to acknowledge the complexities between these constructs that cannot be addressed with correlational data. Although our data appear to support a self-medication model, they may well also support a more complex model reflecting a reciprocal relationship (Stewart & Conrod, 2003) between trauma symptoms and alcohol use. Longitudinal studies can better address the potentially complex dynamic interplay between these symptoms over time. In addition, by concurrently assessing drinking motives, alcohol use, and trauma symptoms, the relationship between those constructs will artificially be strengthened due to the confound of time (Briere, 1997). It is possible that the mediational findings are a product of the design, rather than reflecting the true nature of the relationships between the variables of interest. Nonetheless, these results are promising and do strongly reinforce the need for longitudinal studies to further test the self-medication theory.

5.5. Conclusions

Despite limitations, the present study has a number of strengths to recommend it, including a large sample size, recent trauma among the participants, and inclusion of a drinking motives assessment that appears useful in deepening our understanding of the relationship between trauma symptoms and problematic drinking. Overall, the findings provide support for the self-medication hypothesis and suggest the symptoms that are managed using alcohol may include trauma symptoms more broadly. These results also highlight the importance of alcohol consumption patterns among women who have experienced domestic violence, as the alcohol use itself may be important in understanding their trauma symptoms.

References

Allen, J. G., Coyne, L., & Huntoon, J. (1998). Complex posttraumatic stress disorder in women from a psychometric perspective. *Journal of Personality Assessment*, *70*, 277−298.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173−1182.

Briere, J. (1995). *Trauma symptom inventory: Professional manual.* Orlando, FL: Psychological Assessment Resources.

Briere, J. (1997). Methodological issues in the study of sexual abuse effects. *Journal of Consulting and Clinical Psychology*, *60*, 196−203.

Briere, J., Elliott, D. M., Harris, K., & Cotman, A. (1995). Trauma Symptom Inventory: Psychometrics and association with childhood and adult victimization in clinical-samples. *Journal of Interpersonal Violence*, *10*, 387−401.

Cannon, D. S., Rubin, A., Keefe, C. K., Black, J. L., Keeka, J. K., & Phillips, L. A. (1992). Affective correlates of alcohol and cocaine use. *Addictive Behaviors*, *17*, 517−524.

Clark, A. H., & Foy, D. W. (2000). Trauma exposure and alcohol use in battered women. *Violence Against Women*, *6*, 37−48.

Cooper, M., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology*, *69*, 990−1005.

Cooper, M., Russell, M., Skinner, J. B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment*, *4*, 123−132.

Ford, J. D., & Kidd, T. P. (1998). Early childhood trauma and disorders of extreme stress as predictors of treatment outcome with chronic posttraumatic stress disorder. *Journal of Traumatic Stress*, *11*, 743−761.

Grayson, C. E., & Nolen-Hoeksema, S. (2005). Motives to drink as mediators between childhood sexual assault and alcohol problems in adult women. *Journal of Traumatic Stress*, *18*, 137−145.

Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress*, *5*, 377−391.

Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarify in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychologyv*, *65*, 599−610.

Jacobsen, L. K., Southwick, S. M., & Kosten, T. R. (2001). Substance use disorders in patients with posttraumatic stress disorder: A review of the literature. *American Journal of Psychiatry*, *158*, 1184−1190.

Jones, L., Hughes, M., & Unterstaller, U. (2001). Post-traumatic stress disorder (PTSD) in victims of domestic violence: A review of the research. *Trauma Violence and Abuse*, *2*, 99−119.

Kemp, A., Green, B. L., Hovanitz, C., & Rawlings, E. I. (1995). Incidence and correlates of posttraumatic stress disorder in battered women: Shelter and community samples. *Journal of Interpersonal Violence*, *10*, 43−55.

Kessler, R. C., Molnar, B. E., Feurer, I. D., & Appelbaum, M. (2001). Patterns and mental health predictors of domestic violence in the United States: Results from the National Comorbidity Survey. *International Journal of Law and Psychiatry*, *24*, 487−508.

McDevitt-Murphy, M. E., Weathers, F. W., & Adkins, J. W. (2005). The use of the Trauma Symptom Inventory in the assessment of PTSD symptoms. *Journal of Traumatic Stress*, *18*, 63−67.

McFarlane, A. (1998). Epidemiological evidence about the relationship between PTSD and alcohol abuse: The nature of the association. *Addictive Behaviors*, *23*, 813−826.

Miranda, R. J. R., Meyerson, L. A., Long, P. J., Marx, B. P., & Simpson, S. M. (2002). Sexual assault and alcohol use: Exploring the self-medication hypothesis. *Violence and Victims*, *17*, 205−217.

Nelson, E. C., Heath, A. C., Madden, P. A. F., Cooper, L., Dinwiddie, S. H., Bucholz, K. K., et al. (2002). Association between self-reported childhood sexual abuse and adverse psychosocial outcomes: Results from a twin study. *Archives of General Psychiatry*, *59*, 139−145.

Nishith, P., Resick, P. A., & Mueser, K. T. (2001). Sleep difficulties and alcohol use motives in female rape victims with posttraumatic stress disorder. *Journal of Traumatic Stress*, *14*(3), 469−479.

Read, J. P., Brown, P. J., & Kahler, C. W. (2004). Substance use and posttraumatic stress disorders: Symptom interplay and effects on outcome. *Addictive Behaviors*, *29*, 1665−1672.

Rice, C., Mohr, C. D., Del Boca, F. K., Mattson, M. E., Young, L., Brady, K., et al. (2001). Self-reports of physical, sexual and emotional abuse in an alcoholism treatment sample. *Journal of Studies on Alcohol*, *62*, 114−123.

Rodriguez-Srednicki, O. (2001). Childhood sexual abuse, dissociation and adult self-destructive behavior. *Journal of Child Sexual Abuse*, *10*, 75−90.

Roth, S., Newman, E., Pelcovitz, D., van den Kolk, B., & Mandel, F. (1997). Complex PTSD in victims exposed to sexual and physical abuse: Results from the DSM-IV field trials for posttraumatic stress disorder. *Journal of Traumatic Stress*, *10*, 539−555.

Schuck, A. M., & Widom, C. S. (2001). Childhood victimization and alcohol symptoms in females: Causal inferences and hypothesized mediators. *Child Abuse and Neglect*, *25*, 1069−1092.

Simpson, T. L. (2003). Childhood sexual abuse, PTSD and the functional roles of alcohol use among women drinkers. *Substance Use and Misuse*, *38*, 249−270.

Sobell, L. C., Brown, J., Leo, G. I., & Sobell, M. B. (1996). The reliability of the Alcohol Timeline Followback when administered by telephone and by computer. *Drug and Alcohol Dependence*, *42*, 49−54.

Sobell, L. C., & Sobell, M. B. (1992). Timeline follow-back: A technique for assessing self-reported alcohol consumption. In R. Z. Litten & J.P. Allen (Eds.), *Measuring alcohol consumption: Psychosocial and biochemical methods* Totowa, NJ: Humana Press.

Stewart, S. H. (1996). Alcohol abuse in individuals exposed to trauma: A critical review. *Psychological Bulletin*, *120*, 83−112.

Stewart, S. H., & Conrod, P. J. (2003). Psychosocial models of functional associations between posttraumatic stress disorder and substance use disorder. In P. Ouimette & P.J. Brown (Eds.), *Trauma and substance abuse: Causes, consequences, and treatment of comorbid disorders* (pp. 29−55).

Stewart, S. H., Conrod, P. J., Samoluk, S. B., Pihl, R. O., & Dongier, M. (2000). Posttraumatic stress disorder symptoms and situation-specific drinking in women substance abusers. *Alcoholism Treatment Quarterly*, *18*, 31−47.

Stewart, S. H., Pihl, R. O., Conrod, P. J., & Dongier, M. (1998). Functional associations among trauma, PTSD and substance-related disorders. *Addictive Behaviors*, *23*, 797−812.

Straus, M. A., Hamby, S. L., Boney-McCoy, S., & Sugarman, D. B. (1996). The revised Conflict Tactics Scales (CTS2): Development and preliminary psychometric data. *Journal of Family Issues*, *17*, 283−316.

Testa, M., Livingston, J. A., & Leonard, K. E. (2003). Women's substance use and experiences of intimate partner violence: A longitudinal investigation among a community sample. *Addictive Behaviors*, *28*, 1649−1664.

Ullman, S. E., Filipas, H. H., Townsend, S. M., & Starzinski, L. L. (2005). Trauma exposure, Posttraumatic Stress Disorder and problem drinking in sexual assault survivors. *Journal of Studies on Alcohol*, *66*, 610−619.

Volpicelli, J., Balaraman, G., Hahn, J., Wallace, H., & Bux, D. (1999). The role of uncontrollable trauma in the development of PTSD and alcohol addiction. *Alcohol Research and Health*, *23*, 284−291.

Wechsler, H., Dowdall, G. W., Davenport, A., & Rimm, E. B. (1995). A gender-specific measure of binge drinking among college students. *American Journal of Public Health*, *85*(7), 982−985.

Wilsnack, S. C., Vogeltanz, N. D., Klassen, A. D., & Harris, T. R. (1997). Childhood sexual abuse and women's substance abuse: National survey findings. *Journal of Studies on Alcohol*, *58*, 264−271.